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10/014,101	12/10/2001	Thomas Schmulling	1195-2	2633

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EXAMINER	
BAUM, STUART F	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 06/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/014,101	SCHMULLING ET AL.	
	Examiner	Art Unit	
	Stuart F. Baum	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-137* is/are pending in the application.

4a) Of the above claim(s) *See Continuation Sheet* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-17,25,28-44,46,47,49,50,52,53,79-81,86,87,90-92,95-101 and 103-121* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5/20/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 5,6,18-24,26,27,45,48,51,54-78,82-85,88,89,93,94,102 and 122-137.

DETAILED ACTION

1. Claims 1-137 are pending.

2. Applicant's election with traverse of Group I, claims 1-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101 and 103-137, including SEQ ID NO:26 encoding SEQ ID NO:4 filed 3/19/2004 is acknowledged. The traversal is on the ground(s) that the Commissioner has waived the requirement of 37 C.F.R. §1.141 and permits up to ten nucleotide sequences to be examined in a single application. The Office contends that in regards to the permissible number of sequences as specified in the MPEP, those guidelines were for EST sequences which are much shorter than the nucleic acid sequences presented in the present application, and because of the vast number of sequences now present in the current databases that must be searched, the office does not have the resources to search more than one corresponding pair of nucleic acid and amino acid sequences per application. And lastly, according to the MPEP, up to ten sequences will be examined, and one sequence is considered up to ten, for the reasons stated above.

Applicants contend that it is in the public interest to permit applicants to claim several aspects of their invention together in one application. The Office contends that while the search of the prior art for one group may overlap with that of another, they are not co-extensive of each other and thus would be a burden on the Office.

Applicants contend that the restriction is creating a financial hardship for the client. The Office contends that financial considerations are not requisite in determining patentability of an invention.

The requirement is still deemed proper and is therefore made FINAL.

Claim 5-6, 18-24, 26-27, 45, 48, 51, 54-78, 82-85, 88-89, 93-94, 102 and 122-137 are withdrawn from consideration for being drawn to non-elected inventions.

3. Claims 1-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101 and 103-121 are examined in the present office action.

Oath and Declaration

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: on page 2, of the oath and declaration filed 5/8/2002, the application serial number is incorrect.

Specification/Abstract

5. The abstract of the disclosure is objected to because it is more than one paragraph, should be limited to less than 150 words and should be descriptive of the instant elected invention. Correction is requested. See MPEP § 608.01(b).

6. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See for example page 89, lines 4-6; page 87, line 33; page 83, line 6; and page 90, lines 33-35. See MPEP § 608.01.

Claim Objections

7. Claims 2 and 3 are objected to for being drawn to non-elected material.

Claims 28 and 29 are objected to for being dependent on non-elected claims. For purposes of compact prosecution, the claims will be interpreted to contain all the limitations of the claims from which they are dependent. Correction is requested.

Claim 3 is objected to for not incorporating SEQ ID NO's when referring to nucleic acid or amino acid sequences. 37 CFR 1.821(d) requires the use of the assigned sequence identifier (e.g. SEQ I.D. NO: X) in all instances where the description or claims of a patent application discuss sequences.

Priority

8. Acknowledgment is made of applicant's claim for foreign priority based on an EPO patent application filed on 6/16/2000. It is noted, however, that applicant has not filed a certified copy of the European patent as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 79-81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 79-81 are indefinite for the recitation "diagnostic". It is not clear what are the metes and bounds of "diagnostic". Applicant has not stated or disclosed what diseases are diagnosed using the diagnostic composition. Deleting "diagnostic" will obviate this rejection.

Written Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101 and 103-121 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to a method in which the level of any plant cytokinin oxidase is increased by any means or by using any protein which reduces the level of active cytokinins in a plant, or methods using any nucleic acids that hybridize to SEQ ID NO:26, nucleic acids that are diverging from a nucleic acid encoding SEQ ID NO:4, nucleic acids diverging from those nucleic acids as specified in claim 2 due to differences between alleles, functional fragments of said nucleic acids having biological activity of a cytokinin oxidase, or nucleic acids encoding any plant cytokinin oxidase or any protein that reduces the level of active cytokinins in plants, a nucleic acid encoding a protein with an amino acid sequence comprising SEQ ID NO:32 and which is at least 70% similar to the amino acid sequence of SEQ ID NO:4, a nucleic acid

encoding an immunologically active fragment of a cytokinin oxidase encoded by SEQ ID NO:26 or any immunologically active fragment encoded by any of the nucleic acids specified in claim 3, a nucleic acid encoding any functional fragment of any cytokinin oxidase encoded by SEQ ID NO:26 or any previously mentioned sequence, a vector, host cell and plant comprising said sequence; the claims are also drawn to a diagnostic composition comprising said nucleic acid sequences and a transgenic rootstock overexpressing any plant cytokinin oxidase.

Applicants isolated their invention by identifying from Arabidopsis sequences that exhibited sequence similarity to nucleic acids that encodes a maize cytokinin oxidase (page 86, 1st paragraph). Applicants disclose one cDNA sequence as AtCKX2 (Arabidopsis thaliana cytokinin oxidase-like gene) of SEQ ID NO:26 encoding SEQ ID NO:4 (page 88, 1st full paragraph).

The Applicants do not identify essential regions of AtCKX2 protein encoded by SEQ ID NO:26, nor do Applicants describe any polynucleotide sequences that hybridize to SEQ ID NO:26 or nucleic acids that encode a functional fragment of SEQ ID NO:4 and retains cytokinin oxidase activity. Applicants also do not disclose any other proteins that reduce the level of active cytokinins in a plant. The Federal Circuit has recently clarified the application of the written description requirement to inventions in the field of biotechnology. See University of California v. Eli Lilly and Co., 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). In summary, the court stated that a written description of an invention requires a precise definition, one that defines the structural features of the chemical genus that distinguishes it from other chemical structures. A definition by function does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is. The court goes on to say, "A

description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus." *See University of California v. Eli Lilly and Co.*, 119 F.3d 1559; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997). Applicants fail to describe a representative number of polynucleotide sequences encoding an AtCKX2 protein falling within the scope of the claimed genus of polynucleotides which hybridize to SEQ ID NO:26, are divergent alleles, or encode an immunologically active fragment and Applicants do not identify or disclose any other proteins that reduce the level of active cytokinins in a plant. Applicants only describe a single cDNA sequence of SEQ ID NO:26. Furthermore, Applicants fail to describe structural features common to members of the claimed genus of polynucleotides. Hence, Applicants fail to meet either prong of the two-prong test set forth by *Eli Lilly*. Furthermore, given the lack of description of the necessary elements essential for the AtCKX2 protein or any other protein that lowers the level of active cytokinins in a plant, it remains unclear what features identify an AtCKX2 protein or any protein that lowers the levels of cytokinins in a plant . Since the genus of AtCKX2 proteins has not been described by specific structural features, the specification fails to provide an adequate written description to support the breath of the claims.

Scope of Enablement

11. Claims 1-4, 7-17, 25, 28-44, 46-47, 49-50, 52-53, 79-81, 86-87, 90-92, 95-101 and 103-121 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for methods for stimulating root growth, enhancing lateral or adventitious root

formation, effecting the expression of a polypeptide encoded by SEQ ID NO:26 and increasing the size of the root meristem, comprising transforming a plant with a nucleic acid sequence comprising SEQ ID NO:26 encoding SEQ ID NO:4, and vector, host cells, plant cells and plants transformed therewith, does not reasonably provide enablement for methods for stimulating root growth or enhancing lateral root formation comprising nucleic acids hybridizing to SEQ ID NO:26, nucleic acids that are diverging from a nucleic acid encoding SEQ ID NO:4, nucleic acids diverging from those nucleic acids as specified in claim 2 due to differences between alleles, functional fragments of said nucleic acids having biological activity of a cytokinin oxidase, a nucleic acid encoding an amino acid sequence comprising SEQ ID NO:32 and which is at least 70% similar to the amino acid sequence of SEQ ID NO:4, a nucleic acid encoding any immunologically active fragment of a cytokinin oxidase encoded by SEQ ID NO:26 or any immunologically active fragment encoded by any of the nucleic acids specified in claim 3, a nucleic acid encoding any functional fragment of any cytokinin oxidase encoded by SEQ ID NO:26 or any previously mentioned sequence. In addition, Applicants' disclosure does not reasonably provide enablement for methods for altering root geotropism, increasing the size of seeds, increasing embryo size, or increasing cotyledon size, increasing yield, altering leaf senescence, increasing leaf thickness, reducing vessel size, improving standability of seedlings, increasing branching, improving lodging resistance, increasing early vigor and stress tolerance comprising transforming a plant with SEQ ID NO:26 encoding SEQ ID NO:4 or any nucleic acid encoding a fragment of SEQ ID NO:4 or a immunologically active fragment, or nucleic acid encoding a divergent polypeptide or a nucleic acid that hybridizes with SEQ ID NO:26, or any of the nucleic acids listed in claim 2 or 3 and Applicant is not enabled for a diagnostic composition.

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claimed invention is not supported by an enabling disclosure taking into account the *Wands* factors. *In re Wands,* 858/F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988). *In re Wands* lists a number of factors for determining whether or not undue experimentation would be required by one skilled in the art to make and/or use the invention. These factors are: the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples of the invention, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claim.

The claims are drawn to methods for stimulating root growth or enhancing lateral root formation comprising nucleic acids hybridizing to SEQ ID NO:26, nucleic acids that are diverging from a nucleic acid encoding SEQ ID NO:4, nucleic acids diverging from those nucleic acids as specified in claim 2 due to differences between alleles, functional fragments of said nucleic acids having biological activity of a cytokinin oxidase, a nucleic acid encoding an amino acid sequence comprising SEQ ID NO:32 and which is at least 70% similar to the amino acid sequence of SEQ ID NO:4, a nucleic acid encoding an immunologically active fragment of a cytokinin oxidase encoded by SEQ ID NO:26 or any immunologically active fragment encoded by any of the nucleic acids specified in claim 3, a nucleic acid encoding any functional fragment of any cytokinin oxidase encoded by SEQ ID NO:26 or any previously mentioned sequence. In addition, Applicants' claims are also drawn to methods for altering root geotropism, increasing

yield, altering leaf senescence, increasing leaf thickness, reducing vessel size, improving standability of seedlings, increasing branching, improving lodging resistance, increasing early vigor and stress tolerance comprising transforming a plant with SEQ ID NO:26 encoding SEQ ID NO:4 or any nucleic acid encoding a fragment of SEQ ID NO:4 or an immunologically active fragment, or nucleic acid encoding a divergent polypeptide or a nucleic acid that hybridizes with SEQ ID NO:26, or any of the nucleic acids listed in claim 2 or 3 and a diagnostic composition comprising said sequences.

Applicants isolated their invention by identifying from Arabidopsis sequences that exhibited sequence similarity to nucleic acids that encodes a maize cytokinin oxidase (page 86, 1st paragraph). Applicants disclose one cDNA sequence as AtCKX2 (Arabidopsis thaliana cytokinin oxidase-like gene) of SEQ ID NO:26 encoding SEQ ID NO:4 (page 88, 1st full paragraph). Applicants transformed Arabidopsis and tobacco with SEQ ID NO:26 (page 100, lines 25-27). Transformed plants exhibited a higher level of cytokinin oxidase activity, decreased stem elongation, more lateral roots, thicker roots, longer primary roots, increased fresh and dry weight, delayed onset of flowering, reduced number of seeds per capsules (siliques), all of which compared to plants not transformed with said nucleic acid (pages 101-107).

Re: Claims 1-2, 46-47, 90-92, 95-97, 103-108. Applicants fail to provide guidance for methods of altering root geotropism, increasing yield, altering leaf senescence, increasing leaf thickness, reducing vessel size, improving standability of seedlings, increasing branching, improving lodging resistance, increasing early vigor, stress tolerance, seed size, embryo size or cotyledon size comprising transforming a plant with SEQ ID NO:26 encoding SEQ ID NO:4, or transforming a plant with any nucleic acid that encodes a protein that lowers the level of

cytokinins in a plant. In fact, Applicants disclose that plants transformed with SEQ ID NO:26 had smaller leaves (page 106, bottom table) and seeds whose weight was not statistically different from untransformed seeds (page 105, bottom table). Applicants have not disclosed how decreasing cytokinin levels alters root geotropism, increases leaf thickness or how yield is increased even though plants produce less seeds, smaller leaves and flowers size is not changed.

The state-of-the-art teaches that not all cytokinin oxidases are the same. Kaminek et al (1990, Plant Physiol. 93:1530-1538) teach the isolated cytokinin oxidases from callus cultures of *Phaseolus vulgaris* L. cv Great Northern and *Phaseolus lunatus* L. cv Kingston have different enzyme activities and the pH optimum for cytokinin oxidase from *Phaseolus vulgaris* L. cv Great Northern is 6.5 whereas the pH optimum for cytokinin oxidase from *Phaseolus lunatus* L. cv Kingston is 8.4. Hare et al (1994, Physiologia Plantarum 91:128-136) teach that substrate specificity varies; cytokinin oxidase from the moss *Funaria* has a high affinity for the cytokinin kinetin, whereas most plant cytokinin oxidases do not have a high affinity for kinetin. They further report that cytokinin oxidases from *Dictyostelium discoideum* and *saccharomyces cerevisiae* have a broader substrate specificity than most plant cytokinin oxidases (page 131, right column, 1st paragraph).

Applicants claims are drawn to nucleic acid sequences encoding functional fragments of a cytokinin oxidases, or immunologically active fragments of a cytokinin oxidase, or nucleic acids that are diverged from SEQ ID NO:26. The state-of-the-art is such that one of skill in the art cannot predict which nucleic acids that exhibit less than 100% sequence identity to SEQ ID NO:26 will encode a protein with the same activity as a protein encoded by SEQ ID NO:26. The prediction of protein structure from sequence data and, in turn, utilizing predicted structural

determinations to ascertain functional aspects of the protein, is extremely complex, and the positions within the protein's sequence where amino acid substitutions can be made with a reasonable expectation of maintaining function are limited (Bowie et al, Science 247:1306-1310, 1990, see especially page 1306). Proteins may be sensitive to alterations in even a single amino acid in a sequence. For example, the replacement of a glycine residue located within the START domain of either the PHABULOSA or PHAVOLUTA protein receptor with either an alanine or aspartic acid residue, alters the sterol/lipid binding domain (McConnell et al, Nature 411 (6838):709-713, 2001, see especially page 710, left column, 2nd paragraph).

Applicants claims are drawn to nucleic acid sequences that hybridize to SEQ ID NO:26, but the state-of-the-art teaches isolating DNA fragments even using stringent hybridization conditions, does not always select for DNA fragments whose contiguous nucleotide sequence is the same or nearly the same as the probe. Fourgoux-Nicol et al (1999, Plant Molecular Biology 40 :857-872) teach the isolation of a 674bp fragment using a 497bp probe incorporating stringent hybridization conditions comprising three consecutive 30 minute rinses in 2X, 1X and 0.1X SSC with 0.1% SDS at 65^0C (page 859, left column, 2nd paragraph). Fourgoux-Nicol et al also teach that the probe and isolated DNA fragment exhibited a number of sequence differences comprising a 99bp insertion and a single nucleotide gap, while the DNA fragment contained 2 single nucleotide gaps and together the fragments contained 27 nucleotide mismatches. Taking into account the insertions, gaps and mismatches, the longest stretch of contiguous nucleotides to which the probe could hybridize consisted of 93bp of DNA (page 862, Figure 2).

In the absence of guidance, undue trial and error experimentation would be required for one of ordinary skill in the art to screen through the multitude of non-exemplified sequences,

either by using non-disclosed fragments of SEQ ID NO:26 as probes or by designing primers to undisclosed regions of SEQ ID NO:4 and isolating or amplifying fragments, subcloning the fragments, producing expression vectors and transforming plants therewith, in order to identify those, if any, that when over-expressed have cytokinin oxidase activity and fall within the scope of the claims.

Therefore, given the breadth of the claims; the lack of guidance and examples; the unpredictability in the art; and the state-of-the-art as discussed above, undue experimentation would be required to practice the claimed invention, and therefore the invention is not enabled.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 37-42 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 37-42 are drawn to a seeds or progeny of the transformed plant. Due to Mendelian inheritance of genes, a single gene introduced into a parent plant would only be transferred at most to half the male gametes and half the female gametes. This translates into only three quarters of the progeny having at least a single copy of the transgene and one quarter of the progeny would not carry a copy of the transgene. Given that there is no indication that there would be any other distinguishable characteristics of the claimed progeny (seeds), it is

unclear whether the claimed seeds or progeny would be distinguishable from seeds or progeny that would occur in nature. See *Diamond v. Chakrabarty*, 447 U.S. 303 (1980), *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 76 USPQ 280 (1948), and *In re Bergy , Coats, and Malik* 195 USPQ 344, (CCPA) 1977. The amendment of the claims to recite that the seeds or progeny comprise the construct that was introduced into the parent plant would overcome the rejection.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-4, 7-17, 25, 28-44, 49-50, 52-53, 87 and 98-101 are rejected under 35 U.S.C. 102(b) as being anticipated by Morris (February, 1999, WO 99/06571).

The claims are drawn to a method for stimulating root growth or enhancing lateral and adventitious root formation comprising reducing the level of active cytokinins in a plant or plant part; an isolated nucleic acid encoding a plant protein having cytokinin oxidase activity wherein the nucleic acid hybridizes to SEQ ID NO:26, or wherein the nucleic acid encodes an immunologically acitive fragment of a cytokinin oxidase, or wherein the nucleic acid encodes a functional fragment of a cytokinin oxidase, or wherein the nucleic acid encodes any plant cytokinin oxidase, a vector, host cell, plant transformed therewith, or method for stimulating root, adventitious root, or lateral root growth comprising said nucleic acid, or a method for producing a transgenic plant, or a method for effecting the expression of a polypeptide comprising transforming a plant with said nucleic acid, transgenic plant, plant part harvestable part, or progeny transformed therewith, or a method for increasing root size, a transgenic

rootstock or a method for stimulating root growth and development comprising overexpressing a plant cytokinin oxidase.

Morris teaches a cytokinin oxidase cDNA from maize (ckx1) comprising SEQ ID NO:3 (page 23, lines 30-32), in a vector comprising a promoter that facilitates transcription and transformed into *Pichia pastoris* (page 26, Example 2) and transformed into tobacco using a constitutive and root specific promoter (page 29-32, Example 4). It would be an inherent property of a plant transformed with a plant cytokinin oxidase that cytokinin activity or levels are reduced and that root growth is stimulated and lateral and adventitious roots are formed. The nucleic acid sequence of Morris would hybridize with Applicants' SEQ ID NO:26 given the lack of specified hybridization conditions. The Office interprets "functional fragment" and "immunologically active fragment" to mean a fragment comprising an epitope to which an antibody can bind (See Applicants' specification page 39, lines 27-29 and page 40, lines 16-17), and as such, Morris anticipates the claimed invention.

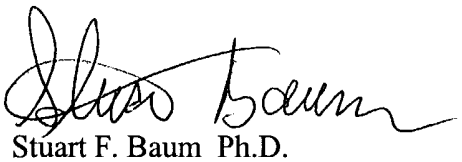
14. Claims 46-47, 79-81, 86, 90-92, 95-97 and 103-121 are deemed free of the prior art, given the failure of the prior art to teach or reasonably suggest a diagnostic composition, a method for altering leaf senescence, a method for increasing leaf thickness, a method for reducing vessel size, a method for improving standability of seedlings, a method for increasing branching, a method of improving lodging resistance, a method for increasing seed size or weight, a method for increasing embryo size, a method of increasing cotyledon size, or wherein said method also increases yield comprising transforming a plant with an isolated polynucleotide of SEQ ID NO:26 encoding SEQ ID NO:4.

15. No claims are allowed.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stuart F. Baum whose telephone number is 571-272-0792. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on 571-272-0804. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1600.



Stuart F. Baum Ph.D.
Patent Examiner
Art Unit 1638
May 27, 2004